A.D. 1868, 20*th* FEBRUARY. N° 566.

SPECIFICATION

OF

PIERRE NICOLAS GOUX.

TREATING AND UTILIZING EXCRETA.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:
PUBLISHED AT THE GREAT SEAL PATENT OFFICE,
25, SOUTHAMPTON BUILDINGS, HOLBORN.
1868.

A.D. 1868, 20*th* FEBRUARY. N° 566.

Treating and Utilizing Excreta.

LETTERS PATENT to Pierre Nicolas Goux, of No. 49, Rue de Longchamps, Paris, in the Empire of France, Agricultural Proprietor, for the Invention of "IMPROVEMENTS IN COLLECTING AND IN DISINFECTING HUMAN EXCRETA AND CONVERTING THE SAME INTO MANURE; ALSO IN THE APPARATUS OR MEANS EMPLOYED THEREIN."

Sealed the 1st May 1868, and dated the 20th February 1868.

PROVISIONAL SPECIFICATION left by the said Pierre Nicolas Goux at the Office of the Commissioners of Patents, with his Petition, on the 20th February 1868.

I, PIERRE NICOLAS GOUX, of No. 49, Rue de Longchamps, Paris, in the Empire of France, Agricultural Proprietor, do hereby declare the nature of my said Invention for "IMPROVEMENTS IN COLLECTING AND IN DISINFECTING HUMAN EXCRETA AND CONVERTING THE SAME INTO MANURE; ALSO IN THE APPARATUS OR MEANS EMPLOYED THEREIN," to be as follows:—

This Invention has for its object the collection of human excreta, and the conversion of the same into a valuable manure in a simple and efficacious manner.

Goux's Improvements in Treating and Utilizing Excreta.

According to my Invention I employ for collecting and treating or disinfecting human excreta, receptacles or vessels of any convenient form and dimensions, portable or otherwise, which receptacles are to be previously lined so as to completely cover their internal surfaces with any suitable or well-known absorbent and disinfectant substance capable of effecting the immediate and complete absorption and fixing of the fertilising gases and liquids contained in the fecal matter. Those absorbents are, by preference, selected which possess fertilising properties of their own and which tend to increase the richness of the manure whilst they also serve for the preservation, disinfection, and solidification of the fecal matter, these operations being all effected during the time the fecal matter remains in the receptacle. By the time the receptacle requires emptying the fecal matters will be in a fit state for application to the land, and the whole, in company with the absorbent lining, is discharged into suitable collecting carts or wagons which convey it away.

In order to facilitate the lining of the interior of the receptacle I employ a mould or mandril, by preference of sheet metal bent to the desired form, which mould I place in the centre of the receptacle and ram up all round it the absorbent materials or substances employed. A handle is provided on the top of the mould or mandril, and the mould itself is made slightly tapered in order to facilitate its withdrawal from the rammed materials which surround it. The receptacle thus lined is ready for use again in collecting and preparing a fresh quantity of fecal matter. The absorbents or disinfectant substances may be employed in a more or less divided or disintegrated form, or may be used in the form of powder or be dissolved and used either in their raw or manufactured state, whether moist or dry according to requirement.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Pierre Nicolas Goux in the Great Seal Patent Office on the 20th August 1868.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, Pierre Nicolas Goux, of No. 49, Rue de Longchamps, Paris, in the Empire of France, Agricultural Proprietor, send greeting.

Goux's Improvements in Treating and Utilizing Excreta.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twentieth day of February, in the year of our Lord One thousand eight hundred and sixty-eight, in the thirty-first year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Pierre Nicolas Goux, Her special license, that I, the said Pierre Nicolas Goux, my executors, administrators, and assigns, or such others, as I, the said Pierre Nicolas Goux, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time, and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN COLLECTING AND IN DISINFECTING HUMAN EXCRETA AND CONVERTING THE SAME INTO MANURE; ALSO IN THE APPARATUS OR MEANS EMPLOYED THEREIN," upon the condition (amongst others) that I, the said Pierre Nicolas Goux, my executors or administrators, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Pierre Nicolas Goux, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the accompanying Drawings, and to the letters and figures marked thereon, that is to say:—

My said Invention has for its object the collection of human excreta and the conversion of the same, whilst in the receptacles in which it is collected, into a valuable manure in a simple and efficacious manner.

In carrying out my Invention I employ a peculiar system of manure producing closet, cesspool, or receptacle, in which I effect the immediate and complete absorption of the gases and liquids contained in the fecal matters by means of absorbent substances which are applied to the bottom and sides of my receptacles before the fecal matters are deposited therein. I employ in preference to fixed cesspools moveable receptacles lined either by hand or by means of the said moulds in order to expedite

the operation with agents capable of absorbing the liquids and metallic salts and of fixing the fertilizing gases.

I shall herein-after give a list of the different materials or substances which I utilize for the purpose of fixing the fertilizing gases, which substances are selected as being of themselves useful for vegetation whilst serving at the same time for the reception, preservation, disinfection, and solidification of the excreta.

By means of my process the nuisance resulting from the emptying of cesspools is avoided and an extremely powerful and valuable manure is obtained which may be used with as much facility as any of those hitherto employed.

I may observe also that according to my system the emptying of the receptacle and the production of manure are effected by the same operation without filtering or separating the matters, the whole of which are subsequently utilized, no portion being rejected.

And in order that my said Invention may be fully understood I shall now proceed more particularly to describe the same, and for that purpose shall refer to the several Figures on the annexed Sheets of Drawings, the same letters of reference indicating corresponding parts in all the corresponding Figures.

Figure 1 is an elevation, and Figure 2 a vertical section of the mould used when ramming the absorbent materials into casks or other receptacles.

Figure 3 is an elevation, and Figure 4 a vertical section of the casks which I employ, and which may be of any required form and dimensions for collecting the excreta.

Figure 5 is a vertical section of a mould of different dimensions.

Figure 6 is a vertical section of a metallic receptacle, which may be of any desired size and of a cylindrical or other convenient form.

Figure 7 is a vertical section of a mould used when ramming the absorbents into the receptacle shewn in Figures 8 and 9.

Figure 8 is a vertical section, and Figure 9 a plan shewing the arrangement of the absorbents in a flat-sided receptacle.

Figure 10 is a vertical section of an oval mould used when disposing the absorbents in the receptacle shewn in Figures 11 and 12.

Figure 11 is a vertical section, and Figure 12 a plan of a receptacle of an elongated rectangular form intended to be placed under the seats of ordinary closets.

Figure 13 is a plan of a receptacle of an oval form intended to be used in the same way as Figure 11.

Figure 14 is a vertical section of a receptacle, which may be of any desired form, in which the absorbents are simply inserted without the use of a mould, and which is provided with a vent pipe for the escape of the air contained in the absorbents.

Figure 15 is a vertical section of a stationary cesspool containing absorbent materials.

Figure 16 is an elevation, and Figure 17 a plan of a urinal adapted to the carrying out of my said Invention.

Figure 18, Sheet 2, is a vertical section of another modification of urinal, and Figure 19 is a plan of the same arrangement.

Figure 20 is a vertical section shewing an arrangement which may be employed for the application of my system to a house of several stories.

Figure 21 is a vertical section, and Figure 22 a horizontal section drawn to an enlarged scale of one of the receptacles shewn on a smaller scale in Figure 21, and provided with a lateral opening.

Figure 23 is a vertical section of a modification of the preceding arrangement.

And Figure 24 is a vertical section shewing a method of closing a pan which may be placed over one of my receptacles.

a represents the absorbent materials disposed in the receptacles or vessels *b*; *c* is the mould, and *d* its cover and handle; *e* are the handles of the receptacle *b*; *f* is a pipe intended to facilitate the escape of the air contained in the absorbents; *g* (Figure 15) represents the absorbent materials introduced into the stationary cesspool; *h* are the apertures leading into the interior of the said cesspool; *i* is a receptacle applied to the urinal and contained in a pit *j* (Figure 18); *k* is a perforated metallic vessel placed on the top of the said receptacle, and *l* are its projecting lips or flanges; *m*, *m*, are wooden or metal partitions for dividing the urinal into a number of compartments; *n* (Figure 20) is a pipe for the descent of the excreta, and *o* is a large receptacle placed underneath the pipe *n* to receive the solid and liquid matters,

combined or separate, as they proceed from the closets; *p* (Figures 20, 21, and 22) is a lateral opening for the escape of the solid fecal matters into the pipe *n*, such opening being closed by a slide *q*; *r* (Figure 23) is a valve closing an opening formed in the bottom of a receptacle which is intended to be substituted for the slide *q*; *s* are hooks which maintain the valve *r* closed. (In Figure 23 the red lines shew the said valve open.) *t*, Figure 24, is a valve filled with pounded charcoal, and closing the bottom of the pan of a watercloset, and *u* is a hinged lid which also actuates the valve *t*, as shewn by red lines.

As herein-before stated, the object of my process is to immediately and completely absorb the gases and liquids contained in the feces and then to preserve them from the action of the oxygen of the air in order to prevent their fermentation, which produces noxious gases.

In order to absorb the gases existing in the feces, or which might be developed therein, and to fix the fertilizing substances therein contained, I make use of chemical agents which have been already employed for this purpose, such as sulphate of iron, of zinc, or of lime and others which I shall herein-after mention; then in order to prevent the contact of the air and avoid fermentation, I employ any species of pulverulent bodies, giving the preference to such as from their nature are capable by themselves of forming a manure; those matters may be of both an absorbent, antiseptic, and disinfectant nature; even the agents used for fixing the gases may form, when it is practicable so to utilize them, an integral part of the absorbents. These matters which are requisite for the mechanical part of the operation will, in almost every case, act as fertilizing agents. These matters may be applied under many forms, they may be more or less divided, cut or pulverized, disintegrated or dissolved, employed in their natural or manufactured condition, and used in a dry or wet state as required.

As herein-before stated, these matters are placed in the receptacles in the manner and at the places most convenient; they may be mixed and disposed in the most suitable order and proportions, and I reserve to myself the right to vary the method of employing these products as experience may suggest without deviating from the nature of my said Invention.

Goux's Improvements in Treating and Utilizing Excreta.

I shall now indicate some of the mineral, animal, vegetable, or mixed substances, which when placed in the receptacles will directly absorb the liquids of the feces and fix their gases. I may mention the following substances as having been found to give good results in practice:—Straw of all kinds, husks, straws and dust from winnowing machines, the refuse and sweepings of grain mills, residues of straw and fodder lofts, stable litter and straw from dung heaps, vegetable mould, dry garden mould, road dust or sweepings, wood ashes, cotton waste of spinning mills, the waste or dust arising from the operation of carding animal or vegetable textile materials, seaweed or wrack, fodder from natural or artificial meadows, reeds of the gladiolus, ferns, mosses, lichens, heaths, house, office, and workshop sweepings, old papers, mud or dirt from town sweepings, paper, straw, or hay from packages; feathers and wastes of feathers, soap boilers' waste or lixivium ashes, carpenters' shavings, flesh and blood dried and disinfected, bone powder carbonized and pulverized, wool, woollen rags, dust from rolling mills, cloth shearings, hair; also dust, raspings, waste clippings of horns and hoofs, short hairs and wastes from tan yards, residue of fat or graves, clippings of hides, glue residues, residiums obtained in the manufacture of Prussian blue, oil cakes of all oleaginous grains or fruits, sawdust, tan or tan waste; charcoal, pulverized, pounded, or whole under all its different degrees and modes of preparation, and produced by all carbonizable vegetables, dung, leaves of all vegetables; solid excreta of all domestic animals, stable refuse, residuum of expressed grapes, apples, or perry, brewers' mash, residuums from starch works and sugar refineries in every state.

I may here state that I may also employ the vegetable substances herein-before described in a fresh or green state. I thus reserve to myself the right to use the leaves and stalks of herbaceous and other vegetables of which the antiseptic action may be advantageously utilized.

Amongst the mineral substances I may mention the sulphates of iron, copper, baryta, lead, ammonia, zinc, potash, soda, magnesia, and alumina or alum, sulphate of lime, chloride of manganese and of magnesium, carbonite of lime or chalk, carbonate of lead or white lead, nitrate of lead, pyrolignite of iron, acetate of protoxide and of sesqui-oxide of iron, acetate of lead, empyreumatic oils, petroleum, nitric acid, chlorhydric acid, black and red pyritous ashes of every description,

coal, wood, and peat ashes, carbonized earth, rich aluminous carbonized clay, carbonized or dried alumina, wet clay, soot, peat carbonized or in its natural condition, lime, phosphate of lime, coprolite, apatite, or phosphorite, sulphate of lime, vitrifiable earth, silicate of soda, felspar, magnesia, nitrates of soda, potash, and magnesia, ammoniacal salts, chloride of sodium, gas tar either in its natural state or carbonized, sulphuric and phosphoric acid, protoxide and peroxide of iron.

In order to collect and absorb the fecal matters I previously dispose the absorbents herein-before described in receptacles made of wood, metal, or other suitable materials, reserving to myself the right to vary the forms and size to suit the position or the requirements of the operation.

I have shewn in Figures 1 and 2 the description of metal mould which I employ for ramming the absorbent materials into the casks or receptacles, and which I consider most suitable for the ready and inexpensive transport of the manufactured manure.

Figures 3 and 4 shew the description of receptacle which I prefer to employ; it will be observed that the interior is lined with pulverulent matters *a*, which are pressed in so as to form a lining, which prevents the immediate contact of the fecal matters with the sides or bottom of the receptable *b*. The absorbent materials are placed in the receptacle by hand or by means of a metal mould or mandrel *c*, provided with a slightly conical lid or cover *d* which facilitates the introduction of the different substances employed for the absorption of the liquid or gaseous bodies, and which are thus rammed in with facility so as to assume the external form of the mandrel. These moulds or mandrels may obviously be made of any suitable material, and be of corresponding form to the receptable required to be lined. It will be observed that my receptacles are provided with handles *e*, by which to lay hold of them in order to place them on carts to convey them where required. The various absorbents herein-before mentioned may also be applied to ordinary portable utensils or receptacles, in order to obviate the inconvenience which attends the present mode of emptying, returning thus if required to the habitual conditions of working, whilst at the same time the fecal matters are utilized by being converted into a valuable manure.

I have shewn in Figures 5 and 6 the mould or mandrill and metallic receptacle which may be advantageously employed when the materials

and workmen necessary for the construction of wooden receptacles cannot be readily obtained.

Figures 7, 8, and 9 represent a peculiar form of wooden receptacle provided with its mandrill. In this arrangement the mandrill is of metal, and of a nearly cylindrical form; the receptacle on the contrary is of wood and of rectangular form.

Figures 10, 11, & 12 represent another form of mandrill and receptacles intended to be applied under the seats of ordinary closets. The receptacle is of a rectangular form, its height being limited by the height of the seat; the mandrill is of metal and of an oval form, in order to facilitate the arrangement of the absorbent materials.

Figure 13 is a modification of the preceding arrangement in which the wooden receptacle is of an oval form. The object of the oval or elongated form is to admit of the introduction into the receptacles of a sufficient quantity of the absorbent materials, which would be difficult with receptacles of any other form on account of their height being necessarily limited.

Figure 14 represents a receptacle into which the absorbents are introduced without the use of a mould, but in this case, as the fecal matters may extend to the sides of the cask, and as they would thus form a very impermeable surface, the air contained in the absorbents cannot readily escape therefrom. With a view to facilitate the escape of the air a small tube *f* is provided, such pipe having perforations throughout that part of its length inserted in the absorbents, whilst on the contrary the upper part of the tube which is in contact with the fecal matters is not perforated on its circumference. This arrangement, which is very simple, or any other similar plan will effect the purpose intended without the use of moulds to ram in the absorbents. I should observe, however, that this is a purely accessary arrangement, as I always consider the use of a mould in ramming-in the absorbents as preferable to any other system.

Figure 15 shews a stationary or permanent cesspool containing such a quantity of absorbents as may be considered desirable, and provided with absorbent materials either mixed or disposed in alternate layers.

Figures 16, 17, 18, and 19 represent arrangements of urinals intended for collecting urine. These consist of a cask *i* disposed in a pit *j* of such a depth that the top of the receptacle may come the requisite

distance above the soil for the use to which it is to be applied. On the cask *i* is disposed a perforated metallic vessel or tray *k*, slightly conical in form, containing a sufficient quantity of absorbent material, and intended to receive the urine direct and prevent the air from coming in contact with that collected in the cask below. The vessel *k* is provided, as shewn in the Drawings, with a certain number of lips *l* which prevent the urine from coming in contact with the outside surface of the cask, and conduct it into the absorbents. Wood or metal partitions *m* are shewn to enable several persons to use the urinal at the same time.

The form and arrangement of the urinals may be varied according to the place where and the particular use to which they are to be applied. By the use of this system the urine may be collected without the emission of smell, and its transport effected at less expence than in collecting it on the absorbents. The urine added to my manures serves to enrich them, and to render soluble the fossil phosphates which may have been used as absorbents. I reserve to myself, however, the right to employ also as urinals my receptacles lined with absorbents by providing them with lips to conduct the urine therein.

Figure 20 represents an arrangement which may be employed in order to obviate the necessity for removing the receptacles which are placed beneath the seat of the closet by the staircase in houses of several stories. This consists in providing these receptacles with a lateral opening, as in Figures 21 and 22, or an opening at the bottom, as in Figure 23, communicating with a vertical pipe *n* of large diameter, and of the same height as the building, such pipe conducting the matters into a receptacle *o* placed underneath, or, what is better still, direct into the cart or waggon intended to convey away the manure produced. By means of this arrangement the urine which escapes by the pipe *n* may be collected in a special receptacle which may be provided for this purpose in order to obviate the necessity for the frequent renewal of the absorbents in the receptacles disposed on the different floors.

Figures 21 and 22 shew a receptacle in which the lateral opening *p* is closed by means of a species of slide *q*, by raising which the matters are caused to fall into the pipe *n* and into a receptacle *o* placed underneath.

Figure 23 shows a modification of the preceding arrangement, in

which the opening is formed at the bottom of the receptacle *r*, the valve to close which is simply maintained fast by means of two hooks *s*.

It is obvious that the external form and method of operation of my apparatus may be modified, and that such means of transport may be employed for the receptacles and the solid and liquid matters, whether separate or mixed together, as circumstances may suggest.

Figure 24 shews a simple method of closing the closet by which all emission of smell is effectually prevented. According to this arrangement the pan is closed by a species of valve *t*, which is operated by the lid *u*, and opens and shuts at the same time as the lid; the valve *t* itself consists of a species of box closed at its lower part by wire gauze, and in which granulated charcoal may be placed or any other substances capable of absorbing the gases which might be evolved therefrom.

It will be readily seen that by the system or method herein-before described, a manure may be produced of a considerable fertilizing power whilst the salubrity of the dwellings and towns where this system is applied are ensured, as fermentation is entirely prevented by the putrescible matters being preserved from contact with the air, the human excreta being collected and preserved in the same manner as those of animals.

Having now described and particularly ascertained the nature of my said Invention, and the manner in which the same is or may be used or carried into effect, I would observe in conclusion that what I consider to be novel and original, and therefore claim as the Invention secured to me by the herein-before in part recited Letters Patent is,—

First. The effecting the immediate and complete absorption of the liquid and gaseous products contained in human excreta by the employment of suitable absorbent substances, such as those herein-before described or their equivalents.

Second. The lining with the said absorbents or their equivalents, by the aid of moulds or mandrills, or otherwise, the interior of the vessels or receptacles intended to receive human excreta, substantially as herein-before described.

Third. The various peculiar constructions and arrangements of

apparatus and the modes of using or applying the same whereby human excreta are collected and the liquid and gaseous products thereof are immediately absorbed, as herein-before described.

Fourth. The peculiar construction of urinals for collecting urine intended to enrich the improved manure and to facilitate the solution of the phosphates, as herein-before described.

In witness whereof, I, the said Pierre Nicolas Goux, have to this my Specification set my hand and seal, the Seventh day of August One thousand eight hundred and sixty-eight.

PIERRE NICOLAS GOUX. (L.S.)

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1868.

A.D.1868. Feb. 20. N° 566.
GOUX' S Specification.

(2 SHEETS)
Planche 1.

FIG. 7.
Coupe Verticale

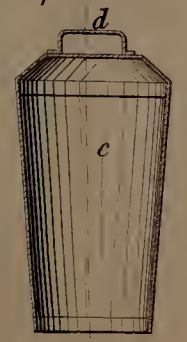


FIG. 1.
Elevation

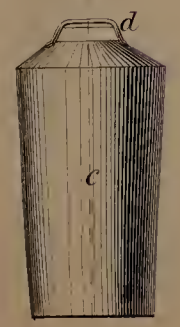


FIG. 10.
Coupe

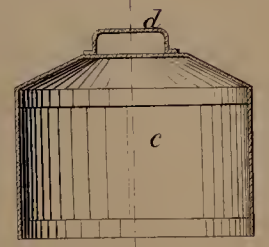


FIG. 2.
Coupe Verticale

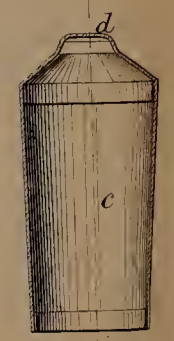


FIG. 13.
Plan

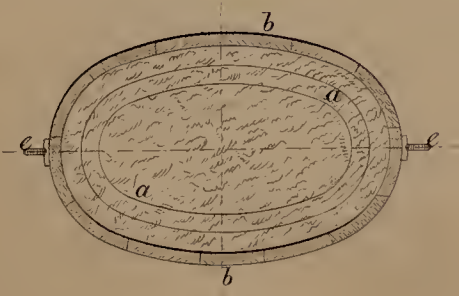


FIG. 5.
Coupe Verticale

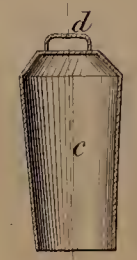


FIG. 16.
Elevation.

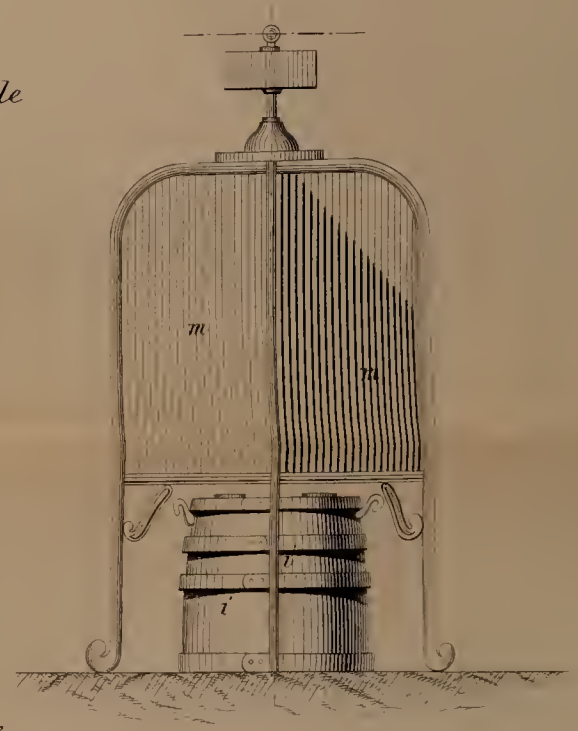


FIG. 8.
Coupe Verticale

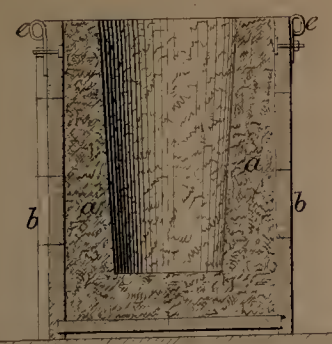


FIG. 3.
Elevation

FIG. 11.
Coupe Verticale

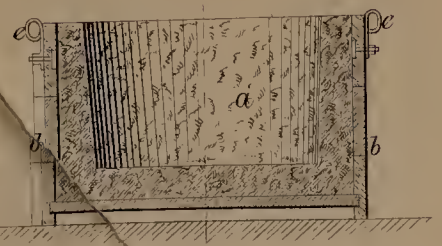


FIG. 4.
Coupe Verticale

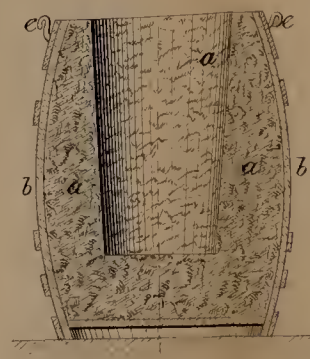


FIG. 14.
Coupe Verticale

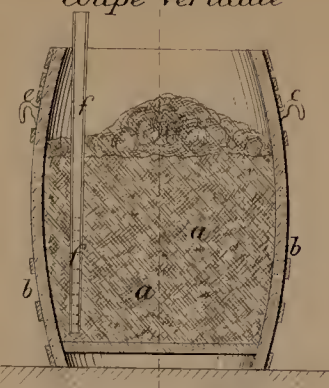


FIG. 6.
Coupe Verticale

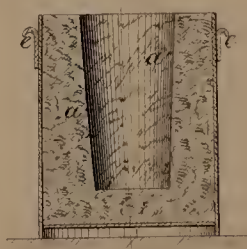


FIG. 9.
Plan

Echelle Variable

FIG. 12.
Plan

FIG. 19.
Coupe Verticale

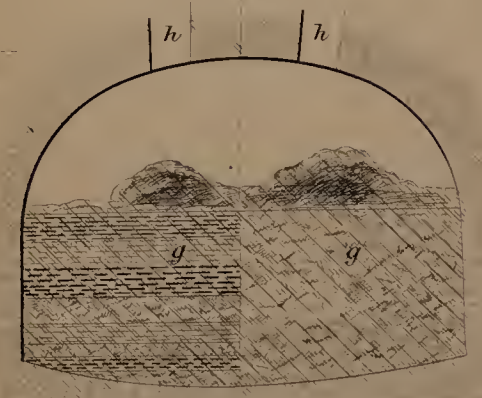


FIG. 17.
Plan

The filed drawing is partly colored.

Drawn on Stone by Malby & Sons

London: Printed by George Edward Eyre and William Spottiswoode
Printers to the Queen's most Excellent Majesty. 1868

FIG. 18.

Coupe Verticale

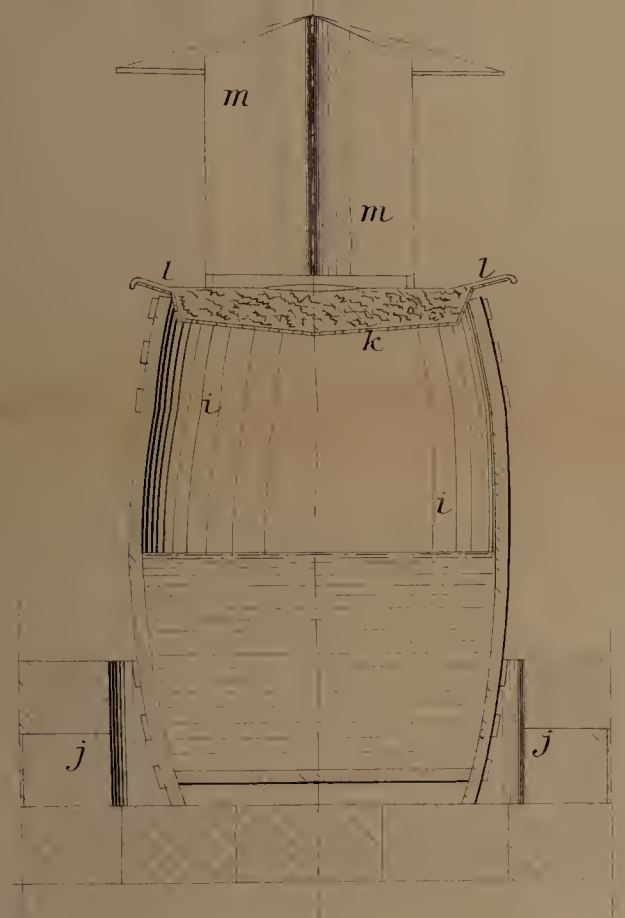


FIG. 19.

Plan

FIG. 20.

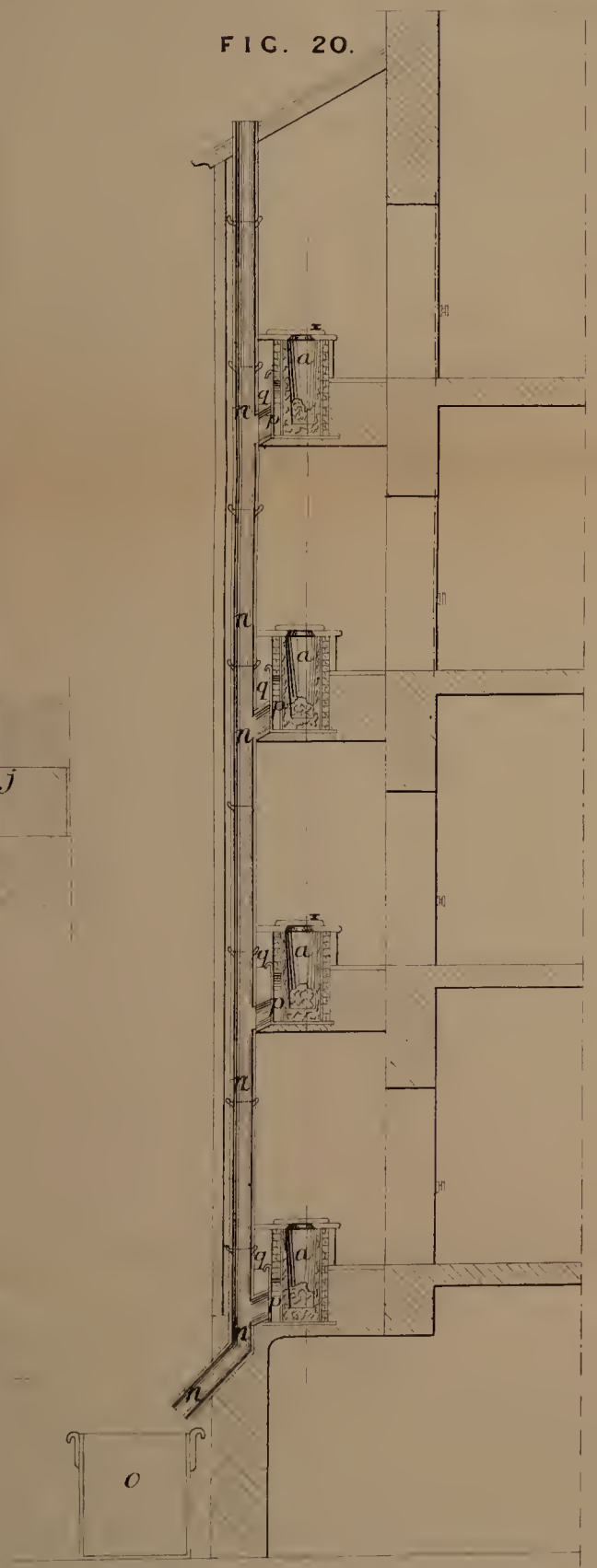


FIG. 21.

Coupe Verticale

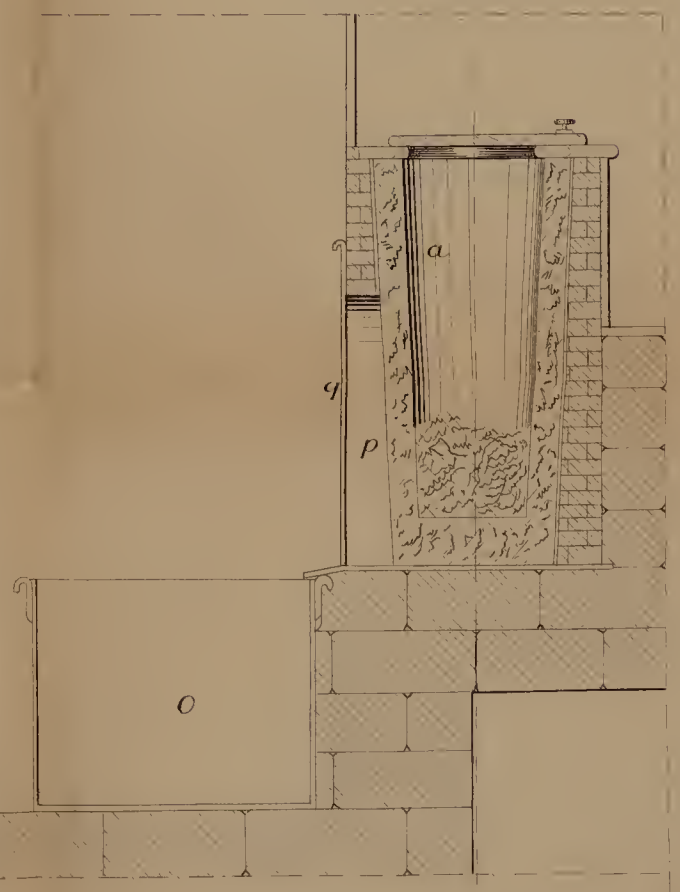


FIG. 22.

Coupe Horizontal

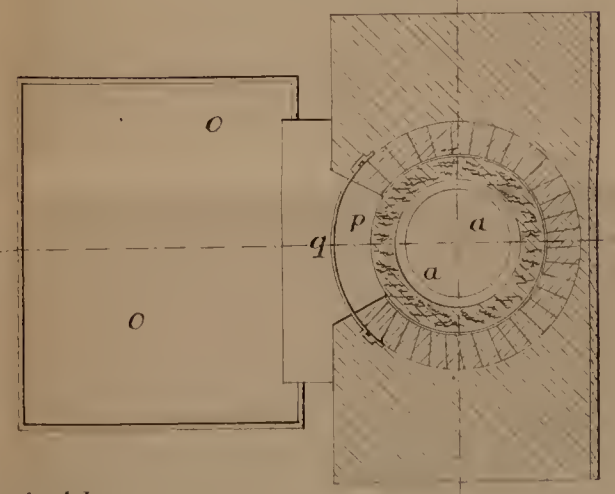


FIG. 23.

Coupe Verticale

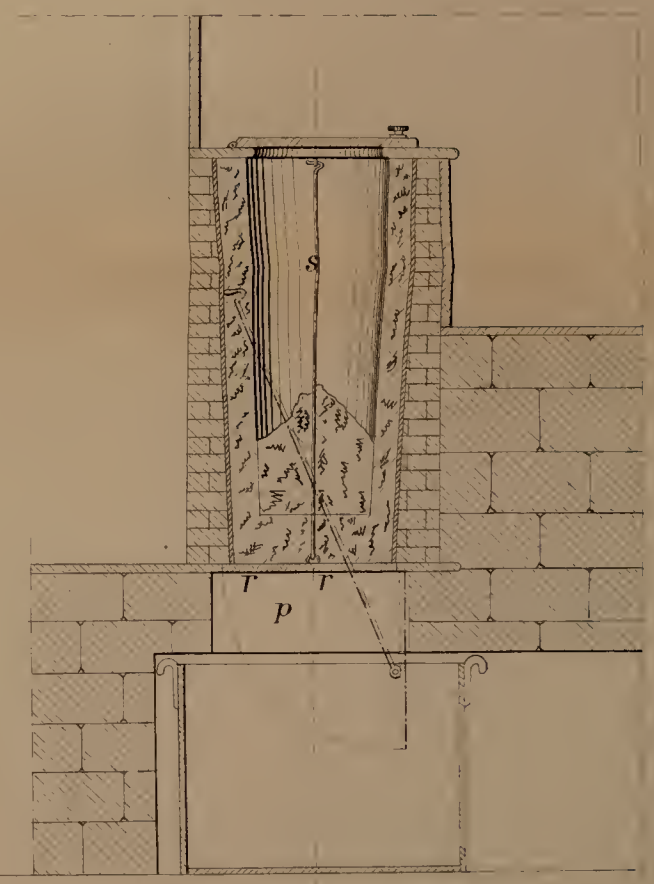
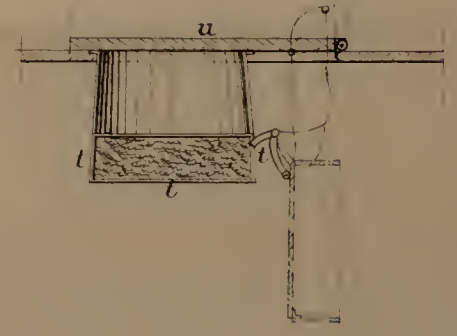


FIG. 24.



Echelle Variable

The filed drawing is partly colored

Drawn on Stone by Malby & Son

London Printed by George Edward Eyre and William Spottiswoode
Printers to the Queen's most Excellent Majesty 1868